

ABSTRACT OF THE DISCLOSURE

On the upstream side of a quantum dot optical amplifier, a polarization beam splitter with one input and two outputs is provided. Two optical fibers connected to output sections of the polarization beam splitter are connected to input sections of the quantum dot optical amplifier in a state that both of the optical fibers have an electric field whose direction being adjusted to maximize its gain, and one optical fiber is twisted by 90° to the other optical fiber. On the downstream side of the quantum dot optical amplifier, a polarization beam splitter with two inputs and one output is provided. Between two optical fibers connected to the polarization beam splitter, one is twisted by 90° to the other. This twisting direction is reverse to the twisting direction of the two optical fibers connected to the input sections of the quantum dot optical amplifier.